

3. REMARKS / DISCUSSION OF ISSUES

Claims 1-17 are pending in the application. Claims 1, 10, 16 and 17 and 8 are in independent form.

Unless indicated otherwise, claims are amended for non-statutory reasons: to correct one or more informalities, remove figure label number(s), and/or to replace European-style claim phraseology with American-style claim language.

I. Allowable Subject Matter

Applicants gratefully acknowledge the indication of allowability of claims 13-15.

II. Objections to the Claims

The objections to the claims 6 and 7 have been considered. Applicants have amended these claims as suggested in the Office Action.

III. Failure to Provide Basis of Rejection of Claims 16 and 17

The Office Action Summary lists claims 16 and 17 as rejected. However, the substantive portion of the Office Action is silent on these claims excepting to indicate that the rejection of these claims based on *Gupta, et al.* is withdrawn. (Kindly refer to point 2. on page 2 of the Office Action.) Because no rejection has been articulated, the rejection of these claims is improper and should be withdrawn.

IV. Rejections under 35 U.S.C. § 102(b)

Claims 1,2,5,6 and 9 are rejected under 35 U.S.C. § 102(b) in view of *Apicella, et al.* (U.S. Patent 5,273,040). For at least the reasons set forth herein, it is respectfully submitted that this rejection is improper and should be withdrawn.

A proper rejection for anticipation "...requires, as the first step in the inquiry, that **all the elements** of the claimed invention be described in a single reference." *In*

re Spada 15 USPQ2d 1655, 1657 (1990). A necessary corollary to the test of anticipation is that "...the absence from the reference of **any claimed element** negates anticipation." *Kloster-Speedsteel AB v. Crucible, Inc.* 230 USPQ 81, 86 (CAFC 1986).

a. Apicella, et al. does not disclose establishing a local intensity variation $[I(x,t)]$ from data values in successive data sets in corresponding spatial positions.

Claim 1 is drawn to a method of analyzing successive data sets. The method includes "...establishing a local intensity variation $[I(x,t)]$ from data values in successive data sets in corresponding spatial positions."

In an embodiment described in connection with Fig. 1 of the filed application, data sets 1a-1d represent an image of a cross-section of the heart. The data sets are successive in time. To wit, image 1b is successive to 1a, etc. Blocks of data values 3a-3b are taken. These are thus successive in time as well. The local intensity variation in time is plotted for blocks 3a-3b in Fig. 2. Illustratively, the intensity variation in curve 12 exhibits a strong maximum that corresponds to a bolus passage in the left ventricle of the heart. The dashed curve 13 of Fig. 2 represents the local intensity variation at the area of the right ventricle.

From the filed application, including the embodiment described above, the local intensity variation from data values in temporally successive data sets in corresponding spatial positions is established.

By contrast, the portion of the reference to *Apicella, et al.* relied upon by the Examiner in the present rejection neither teaches nor suggests the claimed features noted above. To this end, at column 4, lines 35-50 of the reference describe motion detecting means B that causes two temporally adjacent images to be generated. The motion means B includes a first memory means 20 that stores the first temporal image and a second memory means 22 that stores the second image. A subtracting means 24 subtracts the corresponding volume elements (voxels) of the two images generating a temporal difference. As described, the difference image is nearly blank,

except for a dark line around the ventricles that has a width which substantially corresponds to the amount of cardiac movement in the time between the first and second images. An absolute value means 26 is provided to determine an absolute value and to effect a comparison with thresholds.

Accordingly, the portion of the reference to *Apicella, et al.* relied upon for the teaching of the features of claim 1 noted above discloses the detection of motion using a difference image. However, there is not teaching as asserted by the Examiner of the establishing of a local intensity variation $[I(x,t)]$ from data values as claimed.

The Examiner asserts that the difference image represents intensity variation in the temporally adjacent images. However, there is no description of the intensity variation; rather the difference in the voxels from one image to the next. Finally, while the reference discloses the comparison of the voxels of the difference image to a threshold, there is no mention of the establishing local intensity variation as claimed.

For at least the reasons set forth above, it is respectfully submitted that a *prima facie* case of anticipation has not been made. Thus, the rejection of claim 1 is improper and should be withdrawn. Allowance of claim 1 and the claims that depend therefrom is earnestly solicited.

IV. Rejections under 35 U.S.C. § 103(a)

1. Claims 3, 4, 7 and 8 are rejected under 35 U.S.C. § 103(a) as being obvious in view of *Apicella, et al.* in view of other secondary references.

Claims 3,4,7,8, 10-12 depend directly or indirectly from claim 1. At least because claim 1 is allowable over the reference to *Apicella, et al.* for the reasons recited above, these claims are also allowable.

The above notwithstanding, Applicants respectfully traverse the rejection of claim 3. Assuming *arguendo* that *Apicella, et al.* renders claim 1 anticipated, claim 3 is allowable because a *prima facie* case of obviousness has not been established.

The Examiner concedes that *Apicella, et al.* does not disclose the feature of claim 3 of "...localizing the region of interest on the basis of variations in the local intensity variation, notably on the basis of a time derivative $\frac{\partial I(x,t)}{\partial t}$ of the local intensity variation." The Examiner relies on column 8, lines 40-47 of *Gupta, et al.* (U.S. Patent 6,292,683) in an attempt to cure this deficiency.

Applicants submit that the portion of *Gupta, et al.* fails to disclose the feature of claim 3 noted above. The reference does disclose accepting or rejecting matches based on a time series analysis of motion. The translational displacement determination can be accepted or rejected based on a comparison of a translational displacement to a given tolerance. The reference does disclose that the predetermined tolerance can be set for, inter alia, velocity and acceleration. However, there is no mention of the intensity and especially the first partial derivative of the intensity (power per unit area) with respect to time as is claimed.

Finally, the Examiner asserts that the velocity is the time derivative of the intensity. Applicants respectfully submit that the velocity is the time derivative of position, not the time derivative of intensity.

2. Claims 10 and 11 are rejected under 35 U.S.C. § 103(a) as being obvious in view of *Apicella, et al.* in view of *Suri* (U.S. Patent 6,718,055). For at least the reasons set forth herein, Applicants respectfully submit that this rejection is improper and should be withdrawn.

Analysis of obviousness under 35 U.S.C. §103 requires determination of the scope and content of the prior art, the differences between the prior art, and the claims at issue, and the level of ordinary skill in the pertinent art.

W.L. Gore & Associates, Inc. v. Garlock, Inc. 220 USPQ 303, 311 (1983) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (CAFC 1966)). Moreover, there must have been something present in the teachings of the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. *W.L. Gore & Associates* at 311 (citing *In re Bergel* 130 USPQ 206, 208

(CCPA 1961); and *In re Spinnoble* 160 USPQ 237, 244 (CCPA 1969)).

Furthermore, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is a reason, suggestion or motivation to do so. The reason, suggestion or motivation may come from references themselves; from knowledge of those skilled in art that certain references or disclosures in references are known to be of interest in the particular field; or from nature of the problem to be solved to do so found in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.* 37 USPQ2d 1626 (CAFC 1996). Moreover, prior knowledge in the field must be supported by tangible teachings of reference materials. *Cardiac Pacemakers Inc. v. St. Jude Medical Inc.* 72 USPQ 2d 1333, 1336 (CAFC 2004).

However, hindsight is never an appropriate motivation for combining references and/or the requisite knowledge available to one having ordinary skill in the art. To this end, relying upon hindsight knowledge of applicants' disclosure when the prior art does not teach nor suggest such knowledge results in the use of the invention as a template for its own reconstruction. This is wholly improper in the determination of patentability. *Sensonics Inc. v Aerosonics Corp.*, 38 USPQ 2d 1551-1554 (CAFC 1996), citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.* 220 USPQ 303. Moreover, the determination of obviousness cannot be based on the hindsight combination of components selectively culled out from the prior art to fit the parameters of the claims at issue. *Crown Operations International Ltd. v. Solutia Inc.* 62 USPQ2d 1917, 1922 (CAFC 2002).

Claim 10 is drawn to a method of analyzing successive data sets. The method includes "...localizing a plurality of regions of interest on the basis of a local intensity variation, wherein the local intensity variation in said regions of interest being in conformity with a predetermined property..."

The Examiner relies on column 4, lines 42-60 of the reference to *Apicella, et al.* However, nowhere in column 4, lines 42-60 is there a teaching or suggestion of the features of claim 10 noted above. To wit, and in keeping with the discussion of

the traversal of the rejection of claim 1, there is no teaching in *Apicella, et al.* of localizing a plurality of regions of interest on the basis of a **local intensity variation**. The reference does disclose the threshold metric to differentiate between the differential ventricle movement surface or band line and stray differences. However, these teachings of *Apicella, et al.* do not include local intensity variation to localize the plurality of regions.

For at least the reasons set forth above Applicants respectfully submit that the rejection of claim 10 based on *Apicella, et al.* is improper and should be withdrawn. Furthermore, and while in no way conceding the propriety of the rejection or the combination of references of the present rejection, Applicants submit that all claims that depend from claim 10 are allowable at least because of their dependence.

VI. Conclusion

In view of the foregoing, applicant(s) respectfully request(s) that the Examiner withdraw the objection(s) and/or rejection(s) of record, allow all the pending claims, and find the application in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies to charge payment or credit any overpayment to Deposit Account Number 50-0238 for any additional fees, including, but not limited to, the fees under 37 C.F.R. §1.16 or under 37 C.F.R. §1.17.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'W. S. Francos', written over a horizontal line.

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